

UGA Programs for Controlling Palmer Amaranth in 2012 Cotton

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Liberty herbicide, whether you use it today or not, is arguably one of the most important herbicides for the sustainability of our cotton farms. Although cotton resistant to 2,4-D, dicamba, or HPPD herbicides is being developed, the value of these technologies will be greatly reduced if we lose the effectiveness of Liberty to resistance (Figures 1-2). It is absolutely critical that EVERY SINGLE GROWER protect Liberty by using sound management programs (Table 1).

Figure 1. Palmer (7") response to 2,4-D alone or mixed with Liberty.



Figure 2. Palmer (7") response to Clarity alone or mixed with Liberty.



Table 1. Managing Palmer amaranth with Liberty-based programs in tolerant cotton.¹

Preplant	Preemergence (PRE) ²	POST 1 (12-14 d after PRE) ³	POST 2 (14-16 d after POST 1) ³	Layby (15-17 d after POST 2) ³
Valor in burndown program before Palmer emerges	Direx + Prowl + paraquat OR Cotoran + Prowl + paraquat	Liberty + Dual Magnum	Liberty ⁴	Direx + MSMA ⁵
Direx + paraquat + COC (plant within 15 day) OR Tillage (plant within few days)	Reflex + Prowl + paraquat OR Staple + Prowl + paraquat			

¹Cotton must be tolerant to Liberty (glufosinate) herbicide. Follow all labeled herbicide use restrictions, including application rates and plant back intervals.

²Staple systems should be avoided if ALS-resistant Palmer amaranth is present or suspected. Make only one Staple application per year.

³Use shorter time interval if planting after May 10; longer time interval if planting on or before May 10.

⁴A residual herbicide is needed. Dual Mag. can be applied topically only once & currently no tank mix label recommends Warrant + Liberty. Staple would be the only option.

⁵Add adjuvant, grasses must be < 1 inch. LaybyPro or Suprend plus MSMA are similarly effective for emerged Palmer amaranth. Layby Pro offers less residual control.

PROTECT LIBERTY OR DON'T GROW COTTON IN THE FUTURE: THE DECISION IS YOURS!

1. Use at least 5 other types of herbicide chemistry in a Liberty-based cotton management program.
2. Always use residual herbicides at planting and throughout the crop.
3. Do not make more than 2 applications of Liberty per year.
4. Spray Liberty when the biggest pigweed in the field is 3 inches or smaller.
5. Never ever use a reduced rate!
6. Do not apply Liberty within 1 hour of sunset or sunrise.
7. Apply in at least 15 GPA using a speed, spray tip, and pressure that delivers a medium droplet size.
8. Integrate herbicide programs with 1) hand weeding, 2) tillage, and/or 3) heavy rye cover crop residue.



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Glyphosate-resistant Palmer amaranth infests most Georgia cotton fields. Control in RR cotton is challenging but can be accomplished if growers are aggressive and timely with all herbicide applications. It is imperative that growers continue to use sound herbicide programs (Table 2) but also integrate these programs with other control measures, such as hand-weeding, to remove escapes before seed are produced, deep turning to reduce the number of plants emerging in conventional tillage programs, or using a heavy mulch cover crops to suppress emergence in conservation tillage systems.

Table 2. Managing glyphosate-resistant Palmer amaranth in Roundup Ready Flex cotton.¹

Preplant, Preplant Incorporated (PPI), or Preemergence (PRE) ²	POST 1 (10-12 d after PRE) ³	POST 2 (12-14 d after POST 1) ³	Layby (15-17 d after POST 2) ³
CONVENTIONAL TILLAGE			
Reflex 12 oz + Treflan/Prowl PPI ⁴ followed by Reflex 8-12 oz + Direx + paraquat PRE (<i>most consistent at plant option</i>)	glyphosate + Staple ⁵ (Palmer 1" or less) OR glyphosate + Dual Magnum or Warrant ⁶ (no Palmer emerged)	glyphosate + Dual Magnum or Warrant ⁶ (no Palmer emerged)	Direx + MSMA ⁷
Reflex + diuron + paraquat PRE OR Reflex + Prowl + paraquat PRE OR Reflex + Staple ⁵ + paraquat PRE	(Staple mixture more effective > 70% of the time if not ALS-resistant)		
CONSERVATION TILLAGE			
Valor preplant with burndown (no Palmer up) followed by Reflex + diuron + paraquat PRE	glyphosate + Staple ⁵ (Palmer 1" or less) OR glyphosate + Dual Magnum or Warrant ⁶ (no Palmer emerged)	glyphosate + Dual Magnum or Warrant ⁶ (no Palmer emerged)	Direx + MSMA ⁷
Valor + Direx + paraquat (Pigweed emerged, > 2 wk before plant) followed by Reflex + Prowl + paraquat PRE			
Direx + paraquat (Pigweed emerged, < 15 d before plant) followed by Reflex + Prowl + paraquat PRE	(Staple mixture more effective > 70% of the time if not ALS-resistant)		

¹ Follow all labeled herbicide use restrictions, including application rates and plant back intervals.

² Paraquat is needed for all at-plant applications if Palmer is emerged, add adjuvant; glyphosate may be used instead if resistant Palmer is not emerged.

³ Use shorter time interval if planting after May 10; longer time interval if planting on or before May 10.

⁴ Incorporate Reflex 1 to 1.5 inches deep, using a field cultivator. A disk is usually not effective as incorporation is too deep.

⁵ Staple systems should be avoided if ALS-resistant Palmer amaranth is present; make only one Staple application per year in fields where resistance is not present.

⁶ Only one topical application of Dual Magnum can be made per season. Suggest direct spraying Warrant if cotton has more than 6 leaves.

⁷ Add adjuvant. Will not control grasses larger than 1 in. If grasses greater than 1 inch are present, a glyphosate + diuron mixture is in order. LaybyPro or Suprend plus MSMA are similarly effective for emerged Palmer amaranth. Layby Pro offers less residual control or carryover concern.

POST applications based on number of days rather than weed or crop stage in Roundup- or Liberty-based programs.

During 2012, we will be evaluating a new management approach on Georgia farms where POST herbicides are applied based on days after planting. For example, in RR cotton planted on April 25, the grower will plant into a clean seedbed and apply PRE herbicides; at 12 days after the PRE, a POST 1 application will be made; a POST 2 application will be made 14 days after the POST 1 application; and 16 days after the POST 2 treatment will be the layby. Growers are encouraged to try this approach on a limited basis to determine if this approach is helpful. Most likely, this approach will not help, and may actually hurt growers who scout several times a week; however, this program will excel for those who scout weekly or less often. Additionally, this approach must be adjusted when faced with unexpected challenges, such as replanting. These programs consider 1) the need for overlapping residual herbicides (do not want a single emerged Palmer plant), 2) Palmer emergence patterns, 3) Palmer growth rate, 4) longevity of herbicides, and 5) herbicide resistance management. Hand-weeding will likely still be needed but research suggests costs will be reduced by at least 75% for an average producer.